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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/796,615	03/09/2004	Hugo Jorquera Fuentes	14XZ120596(GEMS-0147)	1796

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EXAMINER	
MURALIDAR, RICHARD V	

ART UNIT	PAPER NUMBER
2838	

DATE MAILED: 06/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/796,615	FUENTES, HUGO JORQUERA	
	Examiner	Art Unit	
	Richard V. Muralidar	2838	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 February 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 February 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

FINAL ACTION

Claim Objections

Applicant's amended claim language inferentially claims more than one switch, so it is not clear if the claim requires multiple switches. The amended language reads on line 9: "...*capable of using a single one of the switch*..." which implies more than one switch. However, line 3 refers to "...a switch." This does not provide antecedent basis for more than one switch. Thus it is not clear if the claim precludes more than one switch. Further, the amended claim is not grammatically correct. Appropriate corrections are required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-34, 36, and 37 are rejected under 35 U.S.C. 102(b) as being anticipated by Midya [U.S. 6348781].

With respect to Claim 1 [amended], Midya [U.S. 6348781] discloses a buck/boost converter [Fig. 1, buck/boost converter 20] comprising an input and an output [Fig. 1, buck/boost converter 20 input at V_in, output at V_2]; a switching cell [Fig. 1, the switching cell is comprised of switches 30 and 34,diodes 40 and 46, and inductor 38] with a switch between the input and the output [either of switches 30 and 34 are

between the input and output]; a selector [Fig. 1, buck/boost control circuit 26 working in conjunction with the switching cell comprised of switches 30 and 34, diodes 40 and 46, and inductor 38] selectively configuring the switching cell [switches 30 and 34, diodes 40 and 46, and inductor 38] into at least two configurations from among the following: a parallel chopper configuration [Fig. 2, configured for Boost mode] or a series chopper configuration [Fig. 3, configured for Buck mode] or; an inductive-storage chopper configuration; wherein the cell is capable of using a single one of the switch [Fig. 1, either of switches 30 and 34. Both are used in both modes, either opened or closed] in the at least two configurations.

With respect to Claim 5 [amended], Midya discloses the converter according to claim 1, wherein the switch is a transistor [col. 2 lines 65-67].

With respect to Claim 9, Midya discloses the converter according to claim 1 wherein the switch is a high frequency transistor [col. 4, lines 29-32, the transistors are switched at 1MHz; additionally, given equations 1 and 2 in col. 4, the converter is capable of a wide range of switching frequencies depending on the output voltage desired], for example, 30 kHz [one of ordinary skill in the art can easily choose circuit values such that the switches will fall within a desired frequency operating range].

With respect to Claims 10-14, Midya discloses that the selector [Fig. 1 buck/ boost control circuit 26 working in conjunction with the switching cell comprised of switches 30 and 34, diodes 40 and 46, and inductor 38] comprises a first transistor [Fig. 1, transistor 30] and a second transistor [Fig. 1, transistor 34] Additionally, Fig. 5 shows

the internal circuitry of Buck/Boost control circuit 26, consisting of comparators, gates, and latches. These are all well known in the art to comprise numerous transistors].

With respect to Claims 16-21 [amended], Midya discloses that in the parallel chopper configuration, the transistors are both continuously conducting [col. 3, lines 21-27, switch 30 conducts continuously while switch 34 conducts alternately according to a duty cycle. Both transistors are continuously conducting during the period of time that they are ON during the duty cycle. This is a reasonable assertion because it is obvious that both transistors cannot be continuously ON forever if the circuit is to work as intended].

With respect to Claims 22-27 [amended], Midya discloses that in the series chopper configuration, the transistors are both continuously non-conducting [col. 3 lines 29-32, switch 34 is non-conducting continuously while switch 30 is non-conducting alternately according to a duty cycle. Both transistors are continuously non-conducting during the period of time that they are OFF during the duty cycle. This is a reasonable assertion because it is obvious that both transistors cannot be continuously OFF forever if the circuit is to work as intended].

With respect to Claims 28-33 [amended], Midya discloses that in the inductive storage chopper (meaning buck-boost) configuration [Fig. 1, since Midya's circuit can perform buck and boost modes, it is implicitly capable of buck-boost mode since buck or boost control circuit 26 can switch between Buck or Boost modes as rapidly as desired by adjusting which switch it keeps open or closed as well as the duty cycle] the first transistor is conducting [switch 30 always has a period of conduction; either by being

completely ON whilst 34 is switched at a duty cycle, or during the ON period when switch 30 itself is being switched at a duty cycle] and the second transistor is non-conducting [switch 34 always has a period of non-conduction; either by being completely OFF whilst switch 30 is switched at a duty cycle, or during the OFF period when switch 34 itself is being switched at a duty cycle].

With respect to Claim 36 [new], Midya discloses the switching cell [Fig. 1, the switching cell is comprised of switches 30 and 34,diodes 40 and 46, and inductor 38] has a single switch [Fig. 1, either of switches 30 and 34] between the input and the output, and the cell is capable of using the same single [both switches are used in both modes, either opened or closed] switch in all the configurations.

With respect to Claim 37 [new], Midya discloses that in the inductive-storage chopper (meaning buck-boost) configuration, the first transistor is continuously conducting [switch 30 always has a period of continuous conduction; either by being completely ON whilst 34 is switched at a duty cycle, or during the ON period when switch 30 itself is being switched at a duty cycle] and the second transistor is continuously non-conducting [switch 34 always has a period of continuous non-conduction; either by being completely OFF whilst switch 30 is switched at a duty cycle, or during the OFF period when switch 34 itself is being switched at a duty cycle. Limiting the continuous conduction and non-conduction periods to only the part of the duty cycle when the switches are on and off respectively, is a reasonable assertion because it is obvious that both transistors cannot be continuously ON or continuously OFF *forever* if the circuit is to work as intended].

Claims 2-4, 6-8, 15, and 34 [no changes] stand rejected by Midya [U.S. 6348781] per the first Detailed Action.

Claim 35 [no changes] stands rejected under 35 U.S.C. 103(a) as being unpatentable over Midya [U.S. 6348781] in view if Usui [U.S. 2002/0011825] per the first Detailed Action.

RESPONSE TO ARGUMENTS

Applicant's arguments filed 02/27/2006 have been fully considered but they are *not* persuasive.

With respect to applicant's Claim 1 argument, Applicant's amended claim language does not overcome the arguments of the original office action for the following reasons:

1. Amending the claim language to read: "*...cell is capable of using a single one of the switch...*" conveys substantially the same meaning as the original language which says "*...the cell using the same switch ...*" nothing new has been added.

2. "*Capable of using*" is a statement of intended use only and thus represents purely functional language that does not necessarily add any new structural limitations to Claim 1; however, this limitation has been met as noted above and below.

3. Midya fully meets all of the limitations of Claim 1, including both the original and amended claim language. Please refer to col. 3 lines 17-45, and Figs. 2 and 3, as well as the Claim 1 rejection above. Midya's Fig. 2 shows switch 30 being used [in the closed position] to produce a boost circuit. Fig. 3 shows switch 30 being used [switched

at a certain duty cycle] to produce a buck circuit. Therefore, **switch 30 is the "single switch capable of being used in at least two configurations."**

Alternatively, Fig. 2 also shows that switch 34 being used [switched at a certain duty cycle] to produce a boost circuit; while Fig. 3 shows switch 34 again being used, but open [shown as a diode] to produce a buck circuit. **Therefore, switch 34 can also be the "single switch capable of being used in at least two configurations**." Therefore, Midya is fully anticipatory with regards to applicant's amended Claim 1.

With respect to claims 16-21: Applicant's amended claim language does not overcome the arguments of the original office action for the following reasons:

With regards to applicant's amended claim language, *"...the transistors are **both continuously** **conducting;**"* alternate conduction comprises a time period of continuous conduction, if one considers the length of the on time of the duty cycle over one cycle. Applicant's amended claim language does not specify any detail concerning the length of time or periodicity or non-periodicity of continuous conduction, and it is obvious that both transistors cannot both conduct continuously for an indefinite length of time because then it would cease to be a buck/boost circuit. Therefore Midya discloses continuous conduction of both transistors, one continuously over many cycles, the other continuously over the on-time length of one cycle, in a periodic manner.

Applicant argues that Midya's selector "has been associated" with his switching cell. For purposes of clarification:

The selector comprises, per Claim 1: [Fig. 1, buck/boost control circuit 26 working in conjunction with the switching cell, which is comprised of switches 30 and 34, diodes 40 and 46, and inductor 38].

The switching cell comprises, per Claim 1: [Fig. 1, the switching cell is comprised of switches 30 and 34,diodes 40 and 46, and inductor 38].

The switching cell is a part of the switching selector, and the association is therefore appropriate because *the switching cell will not work without a controller* to supply switching signals to the transistors. This is the exactly same as presented by the applicant; the applicant just chose to omit the switching controller for the transistors.

With respect to applicant's arguments concerning both transistors *continuously* conducting or non-conducting *or any combination of the two*, Midya's switches 30 and 34 both conduct AND non-conduct continuously for different periods:

Switch 34 is off (continuously non-conducting) while switch 30 is switched at a duty cycle (continuously non-conducting during the periods of time it is in the OFF portion of the duty cycle). This qualifies as continuously non-conducting because it is understood that if the switch were to be held continuously non-conducting forever, the circuit would cease to function as a buck/boost circuit.

Similarly, when switch 30 is on (continuously conducting), switch 34 is switched at a duty cycle (continuously conducting during the periods of time it is in the ON portion of the duty cycle). This qualifies as continuously conducting because it is understood that if the switch were to be held continuously conducting forever, the circuit would cease to function as a buck/boost circuit.

Applicant argues the 35 U.S.C. combination between Midya and Usui is improper because it would render Midya's dc-dc converter unsatisfactory for its intended purpose of supplying dc to radios and other battery powered devices etc. The examiner reminds the applicant that the applicant's invention is directed towards a switching cell, with a selector, that can configure a converter from buck to boost, and buck/boost. The source of dc power INTO the converter is irrelevant. DC can be supplied from a battery or a rectifier, or some other appropriate means, and both applicant's and Midya's circuits will still work as intended. Regardless of where the dc comes from, Midya's circuit will still supply dc to radios and other battery powered devices etc. In situations where Midya's circuit was required to operate but only ac power was available, one would simply use a full-wave rectifier to convert the available ac into dc.

Applicant's arguments have been fully considered and rebutted. Applicant's amended claims have been considered, and the rejections under 35 U.S.C 102 in view of Midya and under 35 U.S.C 103 in view of Midya and Usui stand. Accordingly:

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard V. Muralidar whose telephone number is 571-272-8933. The examiner can normally be reached on 9:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Karl D. Easthom can be reached on 571-272-1989. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

6/03/2006
RVM

KARL EASTHOM
SUPERVISORY PATENT EXAMINER